

Integrated CNS Network for the Airport Surface

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General Surface ICNS Comments

1) What Communication services are candidates for transport on a surface ICNS Network?

Critical, non-critical, voice, data, video...

2) What wireless communications technologies should be considered?

802.11(?), 3G, 4G...

3) How could a wireless airport surface ICNS network be implemented to meet all airport communication requirements – who owns, manages and operates?

- Begin Concept of Operations earlier
 - Good set of requirements to drive design
 - RTCA Surface Movement Committee (Surf Movement Runway Incursion)
 - Address Security
- Define what CNS functions will be included into system
- Prioritize users of system
- Separate Physical Network vs. Virtual Network
 - At Small airports-physical network can be shared
 - Level 12 airport will have multiple users
- Demonstration
 - What does transition look like, show viable transition at demonstration phase
- Support of future Surf Work shop?
 - Good idea-should have air traffic users, airspace users, airport authority/board
 - Work shop maybe not good enough-suggest forming a working group w/ airport authority & other stakeholders
 - Need FAA stakeholder ready to take hand-off
 - What surface applications should be included in network?
 - Ground safety/movement (runway incursion) is important. System can aid in reducing runway incursions
 - Open work shop to international attendees, DOD

What Communication (N & S) services are candidates for transport on a surface ICNS Network?

Critical, non-critical, voice, data, video...

- Adaptive systems
- Replacing existing nav/surv systems with new waveforms?
 - Network should be able to transport surveillance info i.e. ASDE-X
 - Systems on Airport Ground
- Nav/Surv Applications
 - Surface Traffic display in cockpit or other applications
- Air-Ground Communications?
 - Fixed Pt-Pt systems
 - Replacement of RTR's will need to be analyzed
 - Seamless integration of common airspace
- What communications services should not be included?
 - Physical vs. virtual network
 - Physical i.e. CCT, Rental car companies
- Include terminal airspace as part of solution
 - Additional value must be added to terminal environment (some type of application)-involves human factors study
- Gatelink is available, major non-disclosed airline is equipping
- Existing regulation doesn't allow mixing critical and non-critical data

What wireless communications technologies should be considered?

802.11(?), 3G, 4G...

- No current WLAN technologies are designed for long-range
 - A lot to choose from: modulation, coding schemes, etc.
 - More important pieces are antennas & power amplifiers
- Investigate Fed-Ex in Memphis Wireless system, all COTS & 802.11?
- 802.20 vs. 802.16
 - 802.20 may be most relevant
- Loss packets & error correction
 - ARQ
 - Latency, timely-data, QOS
 - ADS-B & VDL-3-latency is a big issue
- Common network interface
- May not be able to replace trunk radios (propagation reasons)
 - 5 GHz won't provide all solutions
 - ISM band-may be used for testing
- 802.11i improved security
- Who are users, what needs to be protected?
- Security-physical attacks, eavesdropping
- Perform preliminary security vulnerability assessment
- Wireless moratorium in place @ FAA
 - Goes away once 802.11i begins
- IP Layer security in addition to physical
- Common security solution that is applicable to all users and domains to make cost-effective
- Vulnerability Assessment
 - Safety analysis 8040.4.....
 - Include as part of con ops

How could a wireless airport surface ICNS network be implemented to meet all airport communication (N&S) requirements – who owns, manages and operates?

- FAA-ground + airborne, Airlines-airborne + ground
- One owned, centrally managed or shared (interoperable network)
 - CNS/ATM report
- Applications & services of wireless network should be offered regardless of owners
- Security infrastructure is different from communications infrastructure, who owns & manages each
 - Security management may have to be shared /or sub-netwk w/i own domains
- ATM/CNS security owned by state, from state to FAA
- Airport CNS requirements, airport communications requirements, or airport requirements
 - Communications requirements includes ATS, AOC, AAC, APC, etc.
 - Mission critical
 - ICAO uses same infrastructure
 - Revenue generation
 - Separate in freq. non-critical from mission-critical functions
 - Regardless of institutional barriers, Wireless Netwk should still encompass all needs
- Redundancy/Diversity of WLAN